

The relationship between extremely high temperature and extreme precipitation in summer in China during recent 50 years

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With climate change, more and more studies focus on linkage between mean climatic status and extreme weather events, but relationship between different extreme events is rarely researched. In the context of global warming, a weakened thermal gradient between south and north China can be linked with the probability of precipitation in summer in China. The distribution of summer rainfall belt in China has changed to the so called South-China-flooding-and-North-China-drought pattern in recent years. And the frequency of extreme weather or climate events has experienced the corresponding changes. The relationship between the frequency of extremely high temperature and extreme precipitation are investigated by means of SVD analysis. It is found that extremely high temperature days are less in north China and more in south China, and the extreme precipitation days are shown the opposite distribution during the period of 1980 to 1996. But since 1997, the regions of less extremely high temperature days and more extreme precipitation days were located at the south of the Yangtze River to South China, and the North probably entered into more extremely high temperature and less extreme precipitation events spell. Therefore we mainly analyzed the difference of atmospheric circulation between the former and latter period in east of China where the coefficient are significant at 0.05 level. It is concluded that the weaker summer monsoon has important impact for the pattern of distribution of extremely high temperature and extreme precipitation and the inter-decadal difference of atmospheric circulation is crucial background. And the associated simulation experiments are the main work in the further research.